KENT FLOOD RISK MANAGEMENT COMMITTEE

Monday, 12th November, 2018

2.00 pm

Council Chamber - Sessions House

Kent County Council
kent.gov.uk

AGENDA

KENT FLOOD RISK MANAGEMENT COMMITTEE

Monday, 12th November, 2018, at 2.00 pm Ask for: **Andrew Tait**

Council Chamber - Sessions House Telephone **03000 416749**

Tea/Coffee will be available 15 before the start of the meeting in the meeting room

Membership (7)

Conservative (6): Mr A R Hills (Chairman), Mr A H T Bowles, Mrs L Hurst, Mr P W A Lake, Mr K Pugh and Mr H Rayner

Liberal Democrat (1) Mr I S Chittenden

UNRESTRICTED ITEMS

(During these items the meeting is likely to be open to the public)

Webcasting Notice

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1. Membership

   To note the appointment of Mrs L Hurst, Mr P W A Lake and Mr H Rayner to the Committee in place of Mrs C Bell and the two pre-existing vacancies.

2. Substitutes

3. Declarations of Members' Interest relating to items on today's agenda

4. Minutes of the meeting on 16 July 2018 (Pages 5 - 16)

5. Dates of future meetings

   Monday, 11 March 2019
   Monday, 22 July 2019
   Monday, 11 November 2019
   Monday, 9 March 2020

6. Highways Drainage - programme of planned maintenance - presentation by Earl Bourner, KCC Asset Manager Drainage, Structures and Safety Barriers (Pages 17 - 38)

7. Meeting the Challenge of Highways Drainage - The programme of planned maintenance

8. National Flood Forum - Presentation by Sanjay Johal, National Flood Forum Community Flood Resilience Project Officer (Pages 39 - 54)

9. Environment Agency and Met Office Alerts and Warnings and KCC flood response activity since the last meeting (Pages 55 - 58)

10. Other matters that the Chairman decides are Urgent

EXEMPT ITEMS

(At the time of preparing the agenda there were no exempt items. During any such items which may arise the meeting is likely NOT to be open to the public)

Benjamin Watts
General Counsel
03000 416814

Friday, 2 November 2018

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KENT COUNTY COUNCIL

KENT FLOOD RISK MANAGEMENT COMMITTEE

MINUTES of a meeting of the Kent Flood Risk Management Committee held in the Council Chamber - Sessions House on Monday, 16 July 2018.

PRESENT: Mr A R Hills (Chairman), Mrs C Bell, Mr A H T Bowles, Ida Linfield (Substitute for Mr I S Chittenden), Mr H Rayner (Substitute for Mr K Pugh), Mrs R Doyle (Canterbury CC), Mr L Laws, Mr G Lewin (Swale BC), Mr H Rogers, Mrs C Mackonochie (Tunbridge Wells BC), Mrs G Brown (KALC) and Mr C Mackonochie (KALC)

IN ATTENDANCE: Mr M Tant (Flood Risk Manager), Mr T Harwood (Resilience and Emergency Planning Manager) and Mr A Tait (Democratic Services Officer)

UNRESTRICTED ITEMS

6. Minutes of the meeting on 5 March 2018
(Item 3)

RESOLVED that the Minutes of the meeting held on 5 March 2018 are correctly recorded and that they be signed by the Chairman.

7. Presentation by Mark Rogers from the Met Office (Civil Contingencies) on the Met Office early severe weather warning, climate trends and their implications for flood risk
(Item 4)

(1) Mark Rogers from the Met Office gave a presentation. The accompanying slides are contained within the electronic agenda papers on the KCC website.

(2) Mr Rogers introduced himself as the Met Office Advisor for Civil Contingencies. He worked with Category 1 and 2 Responders as defined by the Civil Contingencies Act 2004 in South East England (Kent Sussex, Surrey, Hampshire, Isle of Wight and Thames Valley).

(3) Mr Rogers said that the National Severe Weather Warning Service (NSWWS) had been set up in 1988 after the hurricane of the previous year. Its original form had been as a threshold-based service. Warnings were issued when severe weather was expected with winds speedsreaching 70 mph or 30 mm of rainfall were anticipated. This approach had ignored the wider impact of severe weather. Its weakness therefore was that there was no policy differentiation between a 70 mph wind speed in Scotland and South East of England despite the greater impact.

(4) In 2011, following a period of consultation with Emergency Responders, the NSWWS had developed an impact-based approach where the decision on whether

to issue Warnings was based on the likely dangers and disruptions caused. The UK was currently the only country in the World operating this system, although a number of countries were now considering doing so after receiving training from the Met Office.

(5) Mr Rogers said that the Met Office had issued Warnings for rain, wind, snow, ice and fog since the formation of the NSWWS. Recently, they had added lightning and thunderstorms. Warnings could now be given seven days ahead of the event. Warnings for thunderstorms had previously been given under the "rain" heading. By specifically warning of likely thunderstorms, the Met Office could now incorporate rain, hail, lightning and strong winds. Warnings for lightning were also particularly important because of its impact on railways and power supplies.

(6) Mr Rogers continued by saying that an Impact Matrix had been introduced in 2011 to complement the new impact-based Warning system. This enabled an accurate assessment by setting the likelihood of an impact occurring against the level of impact expected. This enabled the allocation of a colour to the Warning (green yellow, amber or red). The colour was, however, not all-important. For example, if the box ticked indicated a high likelihood of a low impact event, it required different planning and response to a very low likelihood of a high impact, which would indicate potential danger to life, although a forecast was not at that stage suggesting that it was imminent. Were it to become so, the risk could easily be upgraded to amber. An example of this had occurred during the St Jude's Day storm in October 2013. The Warning had initially been given when the likelihood had been very low. The Warning had then moved up to "low" and "medium" likelihood of a high impact event.

(7) Mr Rogers went on to show examples of how Warnings were issued. They were placed on the Met Office website and on the Met Office App, which enabled people to sign up to receive them. They were usually issued in pdf form and explained the nature of the event, its likelihood and potential impact as well as the area covered by the Warning, its duration as well as giving headlines on what could be expected and displaying the matrix.

(8) Mr Rogers moved on to explain how uncertainty was dealt with. The Chief Forecaster, based in Essex, monitored model information gathered not only in the UK but also that from other countries such as France, Germany, Japan and USA. If all the models were giving similar outputs, it would indicate a high level of certainty. If, on the other hand, they were producing varying results, the level of certainty would be low. Usually, but not always, the models would show more harmony as the event drew closer.

(9) Mr Rogers then gave an example. He showed a model which indicated a track of low pressure across central Southern England with the strongest winds occurring in the South East. If this were the only model, the Met Office would issue a Warning for the medium likelihood of a medium impact event in that part of the country. However, a second model was indicating a track further northwest across Wales with the strongest winds across western and into northern England. The Met Office would deal with the conflicting models by increasing the size of the area covered by the Warning whilst reducing the likelihood of the event to "low."

(10) Mr Rogers said that another significant part of the NSWWS' role was assessing the risk. This involved identifying the location (rural, urban or coastal),

considering the current conditions, including whether there had already been a lot of rain in the location, whether there was capacity in the reservoirs and rivers to cope with the event or whether the ground was so hard after several weeks without moisture that heavy rain would run off and increase the risk of flooding. Another consideration was the time of year. The impact of heavy rain in the Autumn would lead to greater problems in that the drains and rivers were likely to be blocked by falling leaves. Strong winds in the Summer were more serious than in the Winter because trees were in leaf and vulnerable camp sites, caravan and mobile home parks were more likely to be populated. The time of day was also very important as the impact would be greater during busy periods for travel.

(11) Mr Rogers turned to the Flood Guidance Statement which was created by the Flood Forecasting Centre, set up in 2009 as a result of the Pitt recommendations. The Flood Forecasting Centre was a joint unit involving the Met Office and the Environment Agency. Its purpose was to forecast the risk of flooding over the next five days (covering river, surface water, groundwater and coastal flooding). It issued the Flood Guidance Statement on a daily basis, using the colours green, yellow, amber and red and setting out whether the risk was decreasing, steady or increasing. It also gave a run down and identified areas of concern.

(12) Mr Rogers moved on to the topic of Climate Change. This was analysed through numerous computer models, using different information, which were sorted by the main computer in Exeter before being grouped together. The top and bottom 10% probabilities differed markedly from the rest. Mr Rogers showed the UK Climate Projections which had been completed in 2009. The latest version for 2018 was still at the verification stage and would be ready by the end of the year. Three different projections had been produced. One of these envisaged a lower emissions scenario, a medium emissions scenario and a high emissions scenario. These had been produced for 2020, 2050 and 2080. Mr Rogers showed the medium emissions scenario for summer rainfall which, at worst, was projected by most computers to drop by 20 to 30%, whereas the top 10% predicted a rise in rainfall of 10%. For winter precipitation, the bottom 10% of the computers predicted an increase of 10% whereas the top 10% predicted a rise of 30 to 40%. Although the evidence was complex, the likelihood was that by 2050 rainfall would reduce considerably in the summer and rise significantly in the winter – if the medium emissions projections (which were themselves considered to be a conservative estimate) proved to be correct.

(13) Mr Rogers summarised the summer convection findings at the Met Office Hadley Centre by saying that although summers were likely to become drier by 2100, rainfall would be heavier and in short outbreaks, potentially causing more occurrences of serious flash flooding. This was because the warmer summers in the UK became, the more water would be held in the warm air and storms more violent.

(14) Mr Rogers said that the Met Office had published innovative research in 2017. This had found that in England and Wales there was a 1 in 3 chance of a new monthly rainfall record in at least one region each winter. Met Office records showed that since 1910 there had been 17 record breaking rainfall months or seasons and that 9 of these had occurred since 2000.

(15) Mr Rogers summarised the climate change section of his presentation by saying that its impacts on rainfall were complex and uncertain. There was a greater

risk of surface water flooding as a result of more intense summer rainfall. There was also likely to be an increase in winter rainfall which would lead to a greater risk of river and groundwater flooding. A risk management approach was needed due to the continuing uncertainty.

(16) Mr Bowles said that recent heavy surface water flooding had led to houses being evacuated in 4 of the 23 villages in his Swale division. This was because water on the scarp of the Downs had run off the fields very quickly whilst the roads towards the North Kent Coastal Plain had taken on the form of rivers and the drains were unable to cope. The ability to ensure that the drains were unblocked was well below satisfactory. If serious action was not taken to maintain and clear the drains, there would be severe flooding every time there was heavy rain (which Mr Rogers had predicted would become a more regular occurrence in the future). There was a risk that the County Council would be failing in its duty if it did not increase its efforts to clean out drains and gullies.

(17) The Chairman suggested that the concerns expressed by Mr Bowles could be dealt with by reference to the Environment, Transport and Waste Cabinet Committee in the light of the expert advice given during the presentation.

(18) Mr Rogers replied to a question from the Chairman on the joint working between the Met Office and the Environment Agency. He said that for short term work such as the Flood Forecasting Centre, the Met Office's main role was to forecast the weather whilst the Environment Agency would use its computerised information about local conditions to identify the areas at risk of flooding and the likely impact upon them. This enabled the daily Flood Guidance Statement to be as accurate as possible. In respect of the long-term effects of Climate Change, the Met Office provided the Environment Agency with its modelling of future rainfall, and the Agency then carried out its own modelling around the information provided.

(19) Mrs Brown said that KALC had been told that only those areas at most risk of severe flooding would experience an annual clearance of its gullies and that everywhere else would just be reactive. In Yalding, there was a gully that had been blocked for three years. The clearing work was described on the portal as having been completed, even though this was not the case. When this was queried, it had been explained that the term "clearance" simply meant that it the work had been allocated. The system was not working because three months after the notified clearance had taken place, the gully was still blocked and no effort had been made to unblock it. She suggested that the question of the upkeep of the portal was one which could be covered at the Environment and Transport Cabinet Committee.

(20) Mr Rayner asked about tidal flooding. He referred to the February 1953 tidal flooding event where high spring tides had been effectively forced into the North Sea by low pressure before impacting South East England and the Low Countries. Mr Rogers replied that the Met Office undertook tidal forecasts which took into account winds and pressure levels. This information was sent to the Environment Agency who used it to carry out the flooding forecast for the East Coast.

(21) Mrs Doyle asked about the level of international agreement on climate change modelling. Mr Rogers replied that every country was a member of the World Meteorological Organisation which shared modelling and forecasts. Most countries were also member of the International Panel on Climate Change whose scientists

considered all the modelling in order to develop an international view. There was consequently a general convergence of views, although some scientists did take a different view.

(22) Mr Lewin asked how the data prepared was used by the Insurance Industry. Mr Rogers said that he was aware that Insurance Companies used Met Office projections when considering level of risk.

(23) Mr Rogers replied to a question from Mr Howard Rogers on extremely high temperatures by saying that in addition to the normal forecasting, there was also a Heat Health Watch Service, which was a Public Health / NHS product run by the Met Office. It issued alerts when the temperature was due to reach 30+ degrees. Similar modelling and graphs were produced for temperatures as for rainfall. These indicated that temperatures were likely to rise to the point where monthly temperature records were set ever more frequently.

(24) RESOLVED that:-

(a) Mr Mark Rogers be thanked for his valuable presentation;

(b) Mr Rogers be invited to give a further presentation to the Committee in 2019 once the revised UK Climate Projections have been published; and

(c) the Committee's concerns on drainage be referred to the Environment and Transport Cabinet Committee in the light of the expert advice received from the Met Office during Mr Rogers' presentation.

8. Presentation by the Environment Agency on future flood risks to Kent
(Item 5)

(1) (1) Simon Curd from the Environment Agency gave a presentation. The accompanying slides are contained within the electronic agenda papers on the KCC website.

(2) Mr Curd said that his presentation was an update on flood risk rather than an assessment of future flood risk. He said that there were currently some 85.5k homes and businesses in Kent at risk of flooding from rivers and the sea. These figures did not take account of the presence of flood defences. There are currently over 9,700 flood risk assets in Kent, including defences, structures, pumping stations and culverts, which benefit 40,000 homes and businesses.

(3) Mr Curd said that Kent had been allocated the third highest amount (£189m over the next five years) in grants to deliver capital projects to reduce flood risk in England (behind Yorkshire and Lincolnshire). Over 60% of this figure came from Flood Defence Grant (FDGiA). Kent was a big winner for investment in Flood and Coastal Risk Erosion Management (FCRM) capital projects. The Environment Agency is a significant infrastructure provider, protecting critical infrastructure and preventing millions of pounds worth of flood damage across the county. These projects were expected to reduce flood risk and coastal erosion to more than 27,000 homes. Under the government's partnership funding rules, however, many of these

projects require external contributions to go ahead. Without these contributions, the allocated government funding would be redistributed across the country. In terms of outcome measurements, Mr Curd said these were predominantly evaluated in terms of homes protected.

(4) Mr Curd continued by considering some of the bigger schemes in Kent. The Great Stour Flood Alleviation Scheme was currently in its early stages of development. The Environment Agency was working in Partnership with KCC and Canterbury CC to reduce the risk of flooding from the Great Stour to communities between Ashford and Fordwich, including Canterbury. This would enable the protection of nearly 500 properties and 90 businesses. The scheme had a good cost benefit ratio but would still require a further £2.7m in partnership funding.

(5) Mr Curd went on to say that most of the schemes associated with the Folkestone to Cliff End Flood and Coastal Erosion Risk Management Strategy had now been completed. The Lydd Ranges Scheme was the last one that needed to be completed. Although there had been some problems and discussions in respect of this scheme, it was anticipated that a planning application would be submitted very shortly.

(6) Mr Curd said that the Middle Medway Flood Resilience Scheme had been developed in response to numerous flooding incidents, culminating in the floods of 2013/14. It was installing Property Flood Resilience (PFR) measures to protect a number of houses. Phase 1 had seen the installation of PFR measures to 28 properties. Another 281 properties had been offered the full survey in early 2018, 247 of which had taken up the offer and were having the measures installed. The latest phase would see the scoping taking place for those properties that were unsuitable for PFR. It might be possible to build small walls around the properties or to take other measures in partnership with KCC Highways.

(7) Mr Curd described Mill Farm Natural Flood Management on the River Beult as a project managed by KCC to provide a natural water storage area beneficial to the Beult catchment and biodiversity.

(8) Mr Curd said that the Leigh Expansion and Hildenborough Embankment Scheme was in effect two projects that had to take place simultaneously in order to avoid any negative flooding impact. The Leigh Expansion project would increase capacity and reduce risk to some 1500 properties by increasing storage levels in the Leigh Flood Storage Area from 5.5m m^3 to 9m m^3. The Hildenborough scheme would bring benefit to the low level residential areas of Hildenborough by preventing water from the River Medway reaching beyond its banks. This was another partnership project involving KCC and Tonbridge and Malling BC which been supported by a bid to the South East Local Enterprise Partnership.

(9) Mr Curd asked the Committee to note that this project would not only protect homes but also businesses and create growth and business benefits. As a consequence a bid was made for a contribution from the South East Local Enterprise Partnership (SELEP) Local Growth Fund to provide some of the partnership funding.

(10) Mr Curd said that the Medway Flood Partnership had been created at the end of 2017. It brought together the wide variety of organisations that undertake flood risk

management work in the catchment to coordinate their work. By working so closely together, the partners were able to ensure that they avoided duplication or adversely affecting others' work. An example of this was that all the maintenance plans had been pulled together so that everyone could see all the work that needed to be done and which of the partners was responsible for it.

(11) Mr Curd summarised the main points of his presentation by saying that Kent was a big winner for government investment on capital projects; partnership funding was needed to unlock government funding for FDCRM projects; partnership was key to success and innovation; and that incorporating Natural Flood Management into schemes could help to deliver more and wider benefits. Before concluding, Mr Curd made comments about future flood risk. Surface water would be one of the greater and increasing risks.

(12) Finally, he asked the Committee to give its support to the schemes whilst impressing the importance of this work upon their constituents and areas not just in terms of property protection, but also because of their wider benefits for growth and natural habitats.

(13) Mr Rayner asked whether a decision had yet been made as to where the barrier for the Hildenborough scheme was to be located. Mr Curd replied that the Environment Agency had some idea where the embankment was to be sited. The original intention had been to place it in the school grounds. There was still some design work to be completed and discussions had not yet been held with the intended landowners. He was therefore not able to inform the Committee of its exact location. The embankment did not need to be as high or as long as originally thought. He added that there would be a drop-in session in Hildenborough during November.

(14) Mrs Doyle said that one of the problems in the Canterbury City Council administrative area were the bournes (seasonal rivers) which could cause serious flooding. On the last occasion that this had occurred, some of the residents had hired diggers and diverted the water away from their own land. She asked whether the Environment Agency agreed with such unilateral action. Mr Curd replied that it was the riparian landowner who had responsibility to take water and pass it on. He did not agree with people taking matters into their own hands by taking diggers to ditches. This could have significant and unforeseen knock-on effects.

(15) Mr Howard Rogers said that when the Leigh Barrier project had started life, it had not only included Leigh and Hildenborough, but also some embankment work in East Peckham to protect the industrial estate. As costs had begun to escalate, the work around East Peckham had been reduced in scope. Mr Curd replied that the Leigh and East Peckham projects had always been completely separate. The SELEP bid had been put together by Tonbridge and Malling BC to include East Peckham, Leigh and Hildenborough. It had been done that way to enable the project's potential for economic growth to be demonstrated. The cost of the East Peckham project had been high, resulting in a significant funding gap. Although some firms in the industrial estate had been prepared to part fund work in a small part of it these contributions were not sufficient to fund the whole scheme. The Environment Agency had subsequently considered an alternative scheme to protect some of the residential areas. An outline business case was being developed whilst

funding was still being sought. Unfortunately, the change in scope may result in the loss of a proportion of the LEP funding.

(16) Mr Rayner noted the reduced requirement for the height and length of the Hildenborough Bund and said that this would presumably reduce the cost from that originally put forward. He asked whether some of the savings from that scheme could be used in East Peckham. Mr Curd replied that this would not be possible because it was not permissible to transfer money from one scheme to another. He added that, although it was assumed that the eventual cost of the Hildenborough scheme would be less than originally estimated, it was still too early to be certain that this was the case.

(17) The Chairman asked whether the Environment Agency could produce maps that showed sea defences to complement those that did not. Mr Curd agreed that this might be possible as the Environment Agency did possess this information.

(18) RESOLVED that Mr Curd be thanked for his presentation and that the Environment Agency be invited to attend the same meeting as the Met Office in 2019 once the revised UK Climate Projections have been published.

9. Kent and Medway Offsite Reservoir Inundation Emergency Plan
(Item 6)

(1) Tony Harwood gave a presentation. The accompanying slides are contained within the electronic agenda papers on the KCC website.

(2) Mr Harwood said that much of the agenda for the meeting had focussed on the importance of water storage. His role as an Emergency Plannerwas to ensure effective contingencies in the event of things going wrong. Dams, reservoirs and other water storage facilities being a case in point.

(3) Mr Harwood referred to the regulations and guidance in paragraph 1.2 of the report which dictated the parameters within which such documents as the *Kent and Medway Offsite Reservoir Inundation Emergency Plan* had to be drawn up. There had been some significant dam failures and disasters both internationally and in the UK; the most well-known example being the Banqiao Dam disaster in China in 1975 where 171,000 people had lost their lives and 11m had been made homeless. In the UK, 244 people had lost their lives during the Dale Dike Reservoir disaster in Yorkshire in 1874. More recently, there had been significant dam failures in Laos and North America.

(4) Most countries engaged in very detailed contingency planning for dam failures. In Continental Europe, there were regular emergency drills in those communities that lay down river or in close proximity to dams. Drills also took place in Asia, North America and Africa. This contrasted with the UK where planning tended to assume a lower profile.

(5) Mr Harwood defined a reservoir as a large *raised* water body. This meant that it was conceivable that water could ‘fall out’ very quickly. There were four main types of reservoirs in Kent. Flood storage areas such as Leigh which can currently hold 5.5m m^3 of water, which would expand to 9m m^3 once the works there were

completed. Water Utility reservoirs such as Bewl Bridge which could hold 31.4m m^3 of water. Amenity and landscape features such as Mote Park Lake in Maidstone which held some 200k m3 of water. It was a reservoir, it was raised and was known technically as a "Cascade" because of its relationship with another upstream reservoir. Maidstone BC has invested £1.3m on its spillway and dam structure in order to assure its continued safety. Another designated reservoir (at Leeds Castle) sat above Mote Park Lake, all within the River Len catchment.

(6) Mr Harwood moved on to consider the types of reservoir event. The worst of these would occur as a result of the complete collapse of a dam wall, usually with very little if any warning. The Emergency Plan needed to set out plans for immediate evacuation in these circumstances and also needed to identify which parts of the transport network would be immediately severed and which parts of the critical infrastructure could be impacted.

(7) Another type of event was a slow onset reservoir emergency. This could arise out of a small leak leading to a gradual loss of water, potentially leading to a riparian fluvial flooding event downstream. In 2013/14 the flood storage facility on the Shaw Stream in Boughton Monchelsea was filled to the brim and began over-topping. Such uncontrolled releases could also lead to scouring, where the water would find the point of least resistance, increase the leak and flow out at an ever-increasing rate. Other types of dam break were "Sunny Day" breaches and "Rainy Day" breaches which gave prominence to the prevailing conditions in which the event occurred. The former tended to suggest a structural failure whilst the latter suggested that the breach might be the result of increased flows entering the reservoir.

(8) Mr Harwood turned to the potential consequences of a reservoir inundation emergency which were deaths or injuries to people, damage to property and the residual flooding which was left behind. To cope with these issues, the Plan had to pre-identify access and egress points as well as muster points for emergency responders.

(9) Mr Harwood then showed a slide identifying the large raised reservoirs with capacity above 25,000 m^3 together with the footprint of where and escape of water would go. It did not state the downstream velocity of any such water loss. This information was not in the public realm although it did inform Emergency Planning. The map showed clusters in the Thanet area around "Thanet Earth", in the Mid Kent area focused on the Greensand Ridge also related to agriculture, the flood storage facilities in the Medway catchment area and the upper parts of the Stour.

(10) Mr Harwood said that there was a total of 60 large raised reservoirs which could impact Kent. 44 of these were located within the administrative county of Kent, 6 in the Medway Council area and 10 within neighbouring local authority areas. The lowest capacity of these large raised reservoirs was 24,400 m^3. Kent had more such reservoirs than other parts of the South East. The number of reservoirs was growing largely because of changes in agriculture systems, with new technologies such as polytunnels and Cravo greenhouses requiring significant irrigation.

(11) Mr Harwood concluded his presentation by saying that the Reservoir Inundation Emergency Plan informed the KCC Flood Response Plan and the Local Multi-agency Flood Plans. An ambitious multi-agency Emergency Planning exercise

named *Exercise Tethys* had taken place in November 2017 to validate the Plan and identify learning points. Further lessons had been learned from real events that had occurred at the Leigh Barrier and the Parkwood Farm Reservoir at Brishing Dam, Boughton Monchelsea. The Kent Resilience Forum regularly discussed reservoir safety issues. The former Pan Kent Flood Group had been re-named the Pan Kent Severe Weather Group to indicate that it now had the remit to deal with issues around drought and high winds, in order to ensure that flooding was not treated as an issue on its own.

(12) Mr Harwood replied to a question from Mrs Mackonochie by saying that the determination of planning applications for large reservoirs had to take full account of the volume of water contained in a large reservoir as defined by the Reservoirs Act 1975. This included detailed seeking advice from the Environment Agency. A high level of awareness was also very important when applications came in for fishponds or farm reservoirs to assess the potential for downstream risk. The role of Planning was also significant whenever a development was proposed downstream of an existing reservoir. Although there were a great number of maps produced by the Environment Agency, the reservoir inundation footprint was not always considered. An example of this had occurred at Turkey Mill close to Mote Park Lake in Maidstone where there had been an application for a pre-school with creche facility, which would have been within the footprint area for a potential dam failure at the Lake. This had been raised by Planners and Elected Members at Maidstone BC leading to the development footprint being moved out of harm's way, whilst the planning conditions also required identification of muster points and drawing-up of evacuation plans.

(13) Mr Tant replied to a question from Mr Howard Rogers by saying that under the terms of the Reservoir Act 1975, the undertaker had to appoint an Inspecting Engineer and a Supervising Engineer in addition to the Design Engineer. The Design Engineer had to issues a design certificate followed at a later stage by a further certificate that the facility was able to operate properly. At this point, an on-site plan was developed, followed by an off-site plan. The reservoir had to be inspected every 10 years and it was the undertaker's responsibility to maintain engineers to inspect it. It was the Inspecting and Supervising Engineers who had the statutory responsibility to ensure its safety. The Environment Agency had enforcement powers and also ensured that all the required inspections were carried out.

(14) Mr Rogers, Mr Tant and Mr Harwood replied to a question from Mrs Bell by explaining that the definition of a reservoir was a water storage facility containing 25,000 m^3 of water above ground. The lowest capacity on the map in the Reservoir Inundation Emergency Plan was 24,400 m^3.

(15) Mr Rayner asked what regulatory arrangements were in place to deal with landowners who casually created medium sized water storage facilities on their property. Mr Tant replied that there were a number of regulations in place whose appropriateness depended on the particular circumstances. For example, a facility that stored water from a water course would require planning consent. If the landowner was building a reservoir, a Panel Engineer would need to be employed to design it.

(16) Mr Harwood said that there had been a number of occasions where water storage facilities had been excavated without planning permission, leading to prolonged periods of enforcement action and retrospective planning applications.

(17) RESOLVED that the publication of the updated Kent and Medway Offsite Inundation Emergency Plan be noted.

10. Environment Agency and Met Office Alerts and Warnings and KCC flood response activity since the last meeting
(Item 7)

(1) Mr Harwood introduced the report. He said that the Spring had been very wet with the Long Term Average of rainfall in Kent during March, April and May 2018 being 153% of the average annual figure for this period. The month of June, however had seen a mere 10% of the average annual figure for that month. July had started with a similar dearth of rainfall.

(2) Mr Harwood continued by saying that the heavy rainfall in the Spring had been particularly beneficial in terms of groundwater and reservoir recharge. However, the summer drought had dried up streams and ponds whilst many crops were shrivelling in the fields and had established conditions for recent grassland and moorland fires.

(3) Mr Harwood then said that there had been a few recent periods of significant heavy localised rainfall that were very difficult to plan for. An example of this had occurred in late May between Sittingbourne and Maidstone where flash floods had brought some very serious impacts for residential areas with serious welfare consequences. At the same time, certain nearby areas had experienced very little rainfall, if any. In early July a Severe Weather Warning had been issued for thunderstorms. Towns such as Maidstone had experienced very little precipitation whereas nearby on the Greensand Ridge in places such as Ulcombe and Platts Heath, huge volumes of water had fallen, the road network had become completely inundated as had a number of properties. This was a very challenging time for local residents and responders alike.

(4) RESOLVED that the current water resources situation and the level of warnings received since the last meeting of the Committee be noted.

11. Other Matters
(Item 8)

(1) The Chairman explained that the County Council was moving towards paper-lite committee meetings. Kent County Council Members and Officers were being encouraged to rely on their electronic systems rather than hard copies of the papers. He asked those Members who wished to continue to receive papers in hard copy format to contact the Democratic Services Officer. It was agreed that Members would be contacted before the next meeting as a reminder.

(2) The Chairman also asked Members to let the Democratic Services Officer know if they wished to place an item on the agenda of any meeting.

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Highway Drainage – Programme of Planned Maintenance

Michael Payne
Deputy Cabinet Member for Highways, Transportation & Waste,

Earl Bourner
Drainage & Structures Asset Manager

Our Outcomes

We want to achieve the following outcomes:

- Fewer incidents of highway flooding
- Increased customer satisfaction and confidence
- A robust defence against increased claims for damage and personal injury
- Roads and footways that are protected from the adverse effects of standing water
- Reduced disruption due to carriageway flooding
- Greater resilience against increasingly frequent intense rainfall events.

Our Assets

Roadside drains	250,000
Ponds and Lagoons	250
Pumping Stations	15
Soakaways	8,500

We carry out maintenance in order to:

- Maintain road **safety** and minimise nuisance
- Prevent damage to the structural integrity of the highway and **maximise** it's **lifespan**
- Minimise the impact of highway water on the surrounding environment

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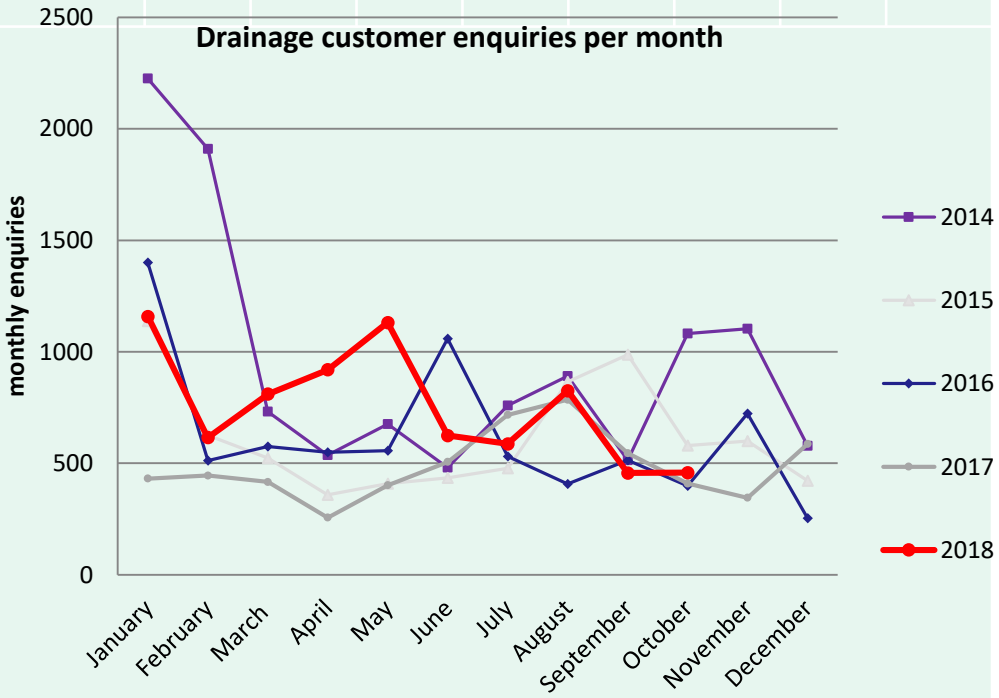
Our Customers

The Drainage team receives over 7,000 enquiries a year of which mostly relate to blocked drains or flooding which has presented a risk to highway safety or impacted private property internally.

Drainage Enquiries Received 2014-2018

	2014	2015	2016	2017	2018
January	2225	1138	1401	431	1158
February	1910	625	512	445	615
March	731	524	575	416	810
April	537	359	549	256	919
May	676	409	556	401	1131
June	481	434	1059	506	624
July	759	477	531	717	587
August	891	865	407	785	825
September	513	987	514	545	456
October	1082	580	399	409	458
November	1103	599	723	345	
December	578	421	254	586	
Total Drainage	11486	7418	7480	5842	7583



Drainage Budget Allocation

Drainage Maintenance **£2,500k** R

We will respond to incidents of flooding that pose an immediate high risk to highway safety or a risk of internal property within 2 hours of the initial report.

We will clean roadside drains at known hotspots on a cyclical basis once every 6 months

We will clean roadside drains on main roads on a cyclical basis once every 12 months

We will carry out targeted cleansing of all other drainage assets where there is a risk to highway safety or a risk of internal property flooding within 2 hours – 90 days (depending on the severity of risk)

Ironwork Repairs **£290k** R

We will repair and replace damaged drain covers that pose a risk to the safety of highway users within 2 hours – 90 days (depending on the severity of risk)

Pumping Station Servicing and Repairs **£30k** R

We will service our pumping stations and prioritise maintenance on the basis of the risk to highway safety and the risk of internal property flooding once every 12 months

Drainage Investigations **£500k** C

We will investigate highway drainage problems that pose a risk to highway safety or a risk of internal property flooding within 2 hours – 90 days (depending on the severity of risk)

Capital Drainage Repairs and Improvements **£3,500k** C

We will prioritise repairs and improvements on the basis of the risk to highway safety and the risk of internal property flooding and deliver them on the basis of the highest risk first

Drainage Maintenance

Scheduled Drain Maintenance, Hotspot Clearance and Reactive Cleansing

- Yearly we clean approx. 70,000 gullies throughout our Strategic & Locally Important Network

- A further 286 roads, known as our Hotspots, are visited on a 6 monthly basis, these locations are at risk of frequent or severe flooding that poses a risk to highway safety and flooding to adjacent properties.

- Reactively an average of 4000 jobs are issued to our contractor in response to customer enquiries to clean gullies, jet lines, cleanse soakaways and generally carry out further investigations to reduce surface water on the network.

Significant Factors that affect Drainage Maintenance

- Damaged and Aging Infrastructure
- Limited Capacity
- Reliance on Third Party Infrastructure
- Land Drainage
- Reductions in other services such as street sweeping

Assessments and Inspections

Our Inspectors and Stewards carry out inspections of the Highway Drainage:

- Planned Inspections
  - Visual safety inspections of all roads including the road drains at least once every **12 months**
  - **Drains on main roads** are cleaned and tested **annually**
  - **Pumping stations** are serviced **annually**

- Reactive Inspections
  - Carried out **in response to customer enquiries**

Capital Drainage Repairs & Improvements

Existing drainage systems are designed to intercept and remove surface water from the highway during moderate rainfall events or short higher intensity rainfall. However the increased frequency of prolonged heavy downpours over recent years have identified the limitations of highway drainage and the fact that they are not simply designed to accommodate these more intense rainfall events.

We use Capital funding for renewing and repairing inadequate systems however we do have to prioritise sites factoring in the nature of the road, safety to highway users and internal flooding to private properties.

Our Capital budget allocation is spent in order of highest risk first. Sites are continually being assessed and identified throughout the year and our Scheme Engineers implements these each year depending on the funding available. There are over 200 major schemes on this programme for this financial year in an attempt reduce highway flooding.

Capital Drainage Repairs & Improvements

This capital programme is an ongoing cycle of identifying the sites, investigating the drainage systems and designing new schemes in line with a 1 in 100 year storm event.

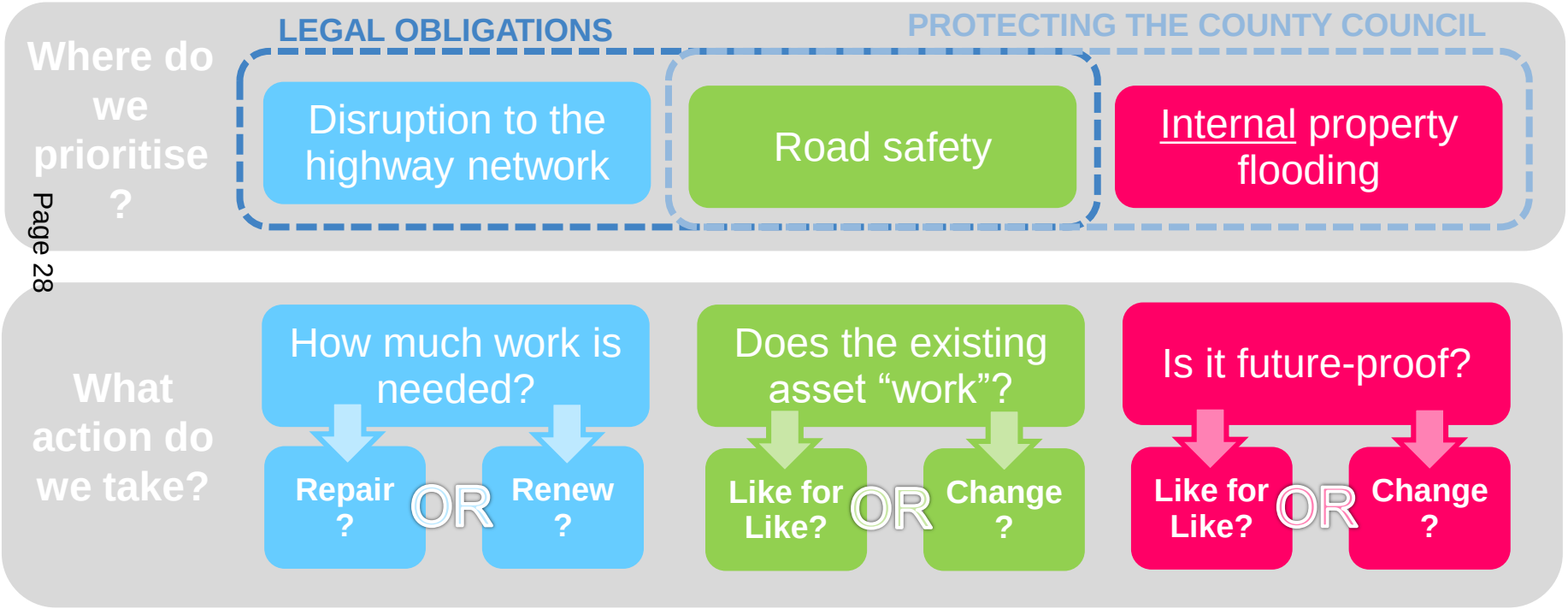
The Drainage Engineer also have budgets to carry out small scale repairs throughout their Districts to resolve flooding issues generally up to the region of 5k and after this amount, the site will be classed within major scheme bracket

We currently have over 100 schemes that have been identified that are of a medium risk that we do not have the available funding for. As funding becomes available these will also be carried out.

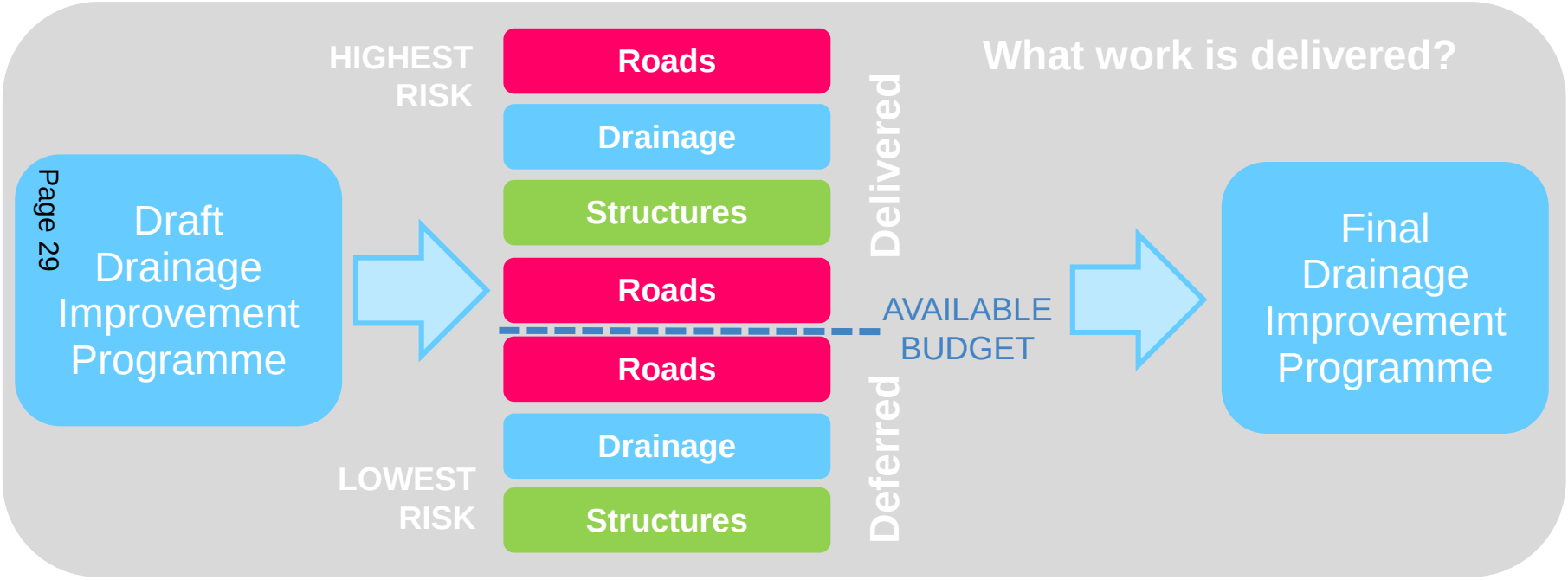
Climate Change

In respect of climate change, when new development are applied for the Flood Team will assess the impacts of different return periods which include climate change. For example, a 1 in 100 year storm event plus 40% to account for climate change will be requested for the developer to design and where flooding is identified, they will check where this impacts to ensure the flood

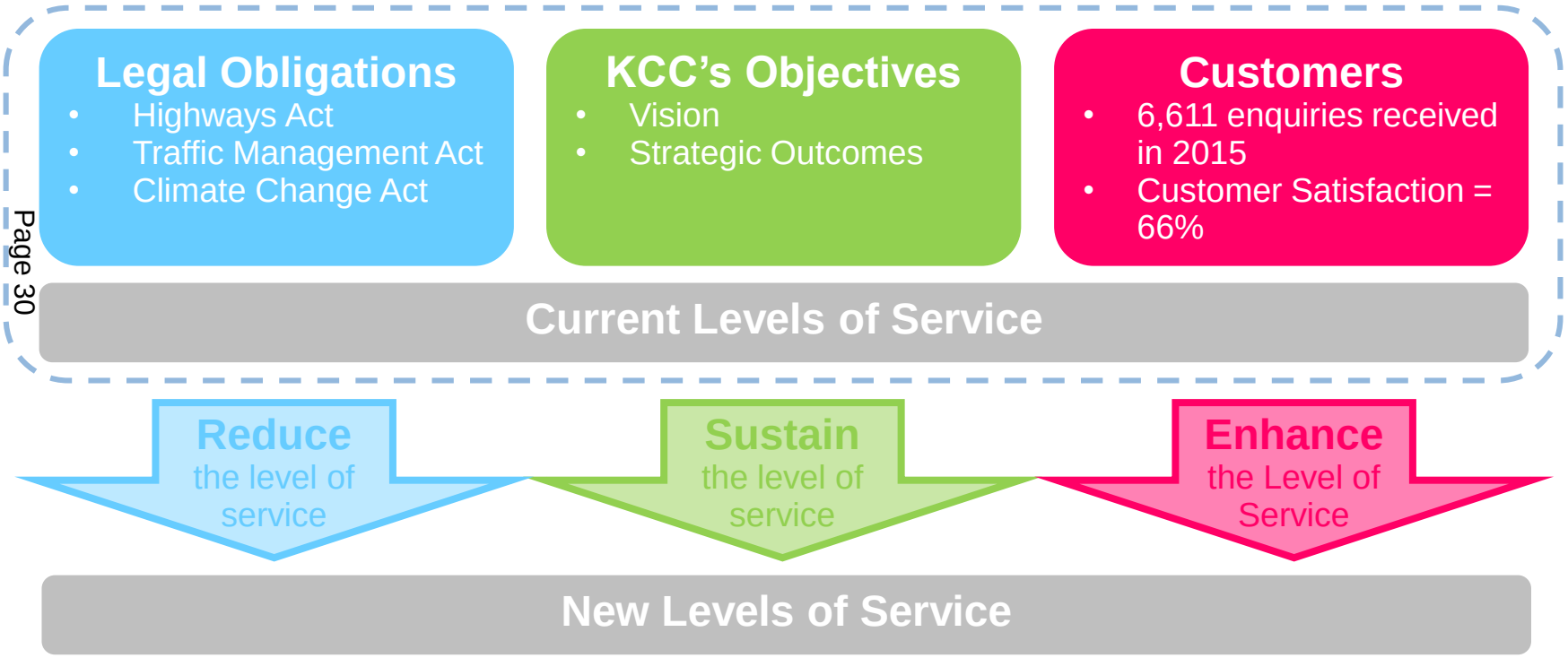
Prioritisation of Investment



Prioritisation of Investment (cont.)

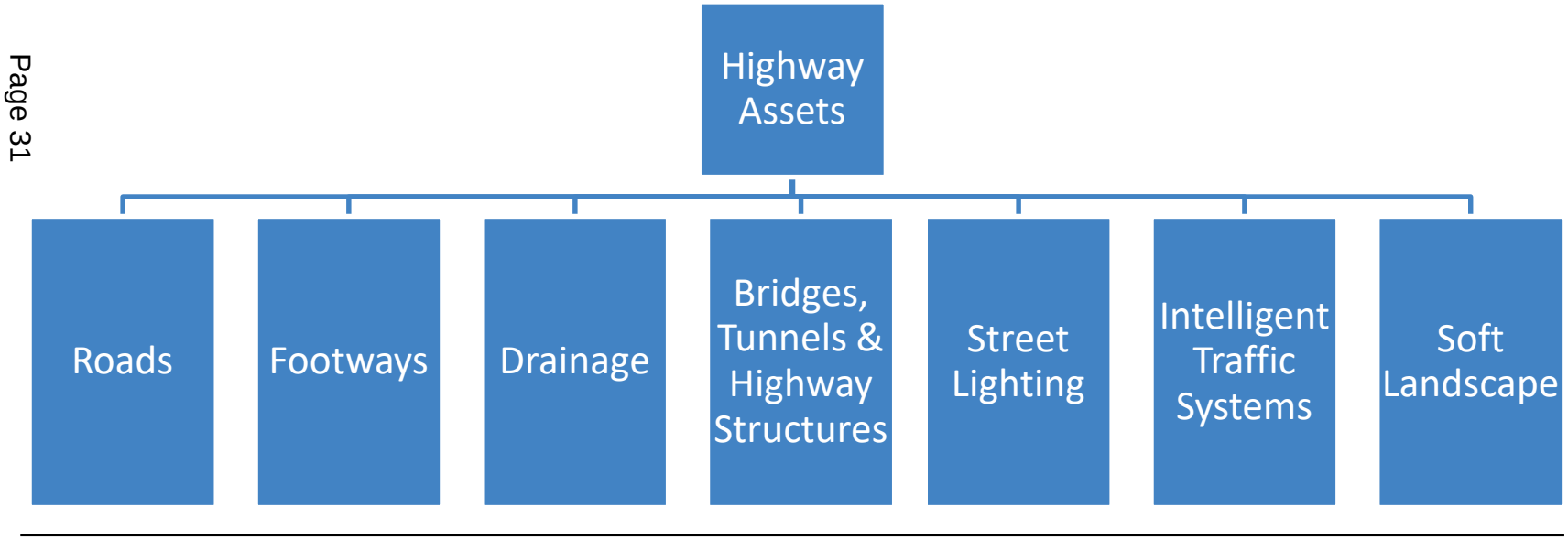


Obligations, Objectives & Customers



Asset Management Approach

KCC Highways are moving to an Asset Management approach in order to manage the Drainage asset using a risk based model going forward.



The Basic Principals for the Asset Management approach for Highway Assets

The Asset	What is the asset and what is it's purpose?
Condition Assessments and Inspections	How do we go about assessing and inspecting our assets so that we understand their condition and performance?
Prioritisation of Investment	How do we prioritise where carry out maintenance and invest our Capital Maintenance Grant?
Other Significant Factors that affect maintenance	What other factors impact upon how our assets perform and the approach we take to maintenance and improvements
Levels of Service	What do we consider when setting levels of service? What are the current levels of service? What are the options for the next financial year?

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map16 | Asset Management

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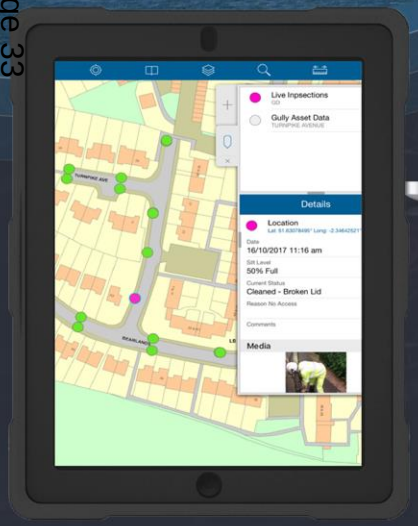

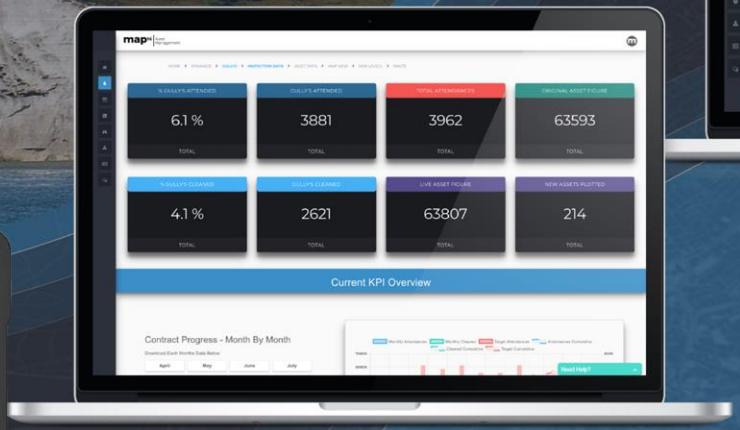

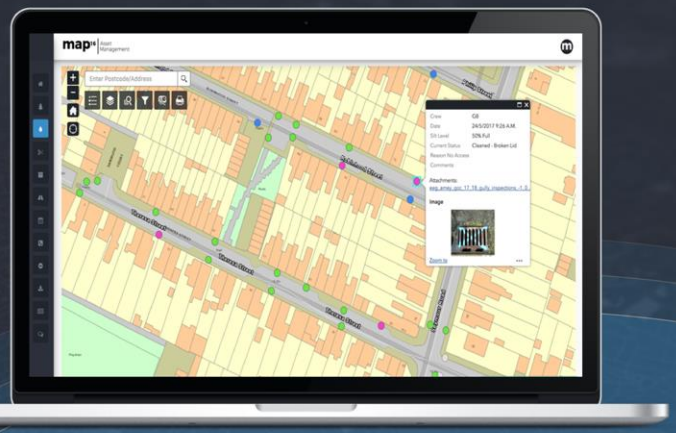

Drainage Mapping & Management

map16 | Asset Management

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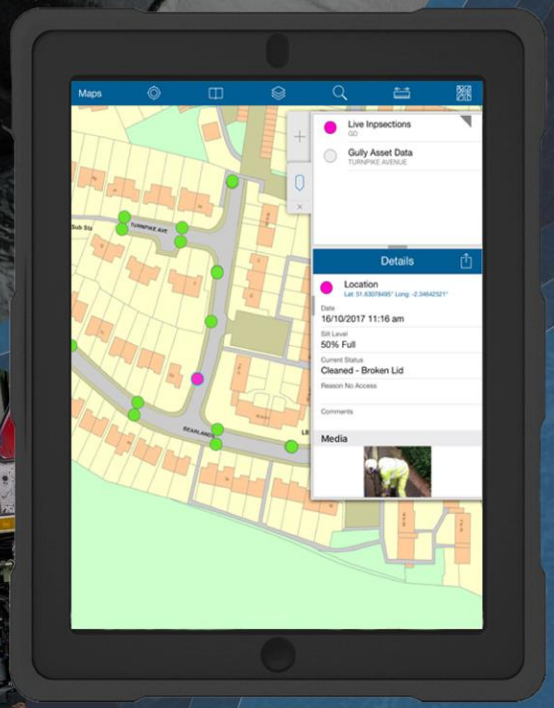
How Does It Work?



Mobile Collection

Inspection data is collected via teams on the ground using map16 tablets

Conditional Information - Silt levels
Defects - Broken/ blocked gullys
Comments - Any other key information

Data collected is instantly available to Kent County Councils using their web dashboard

map16 Asset Management

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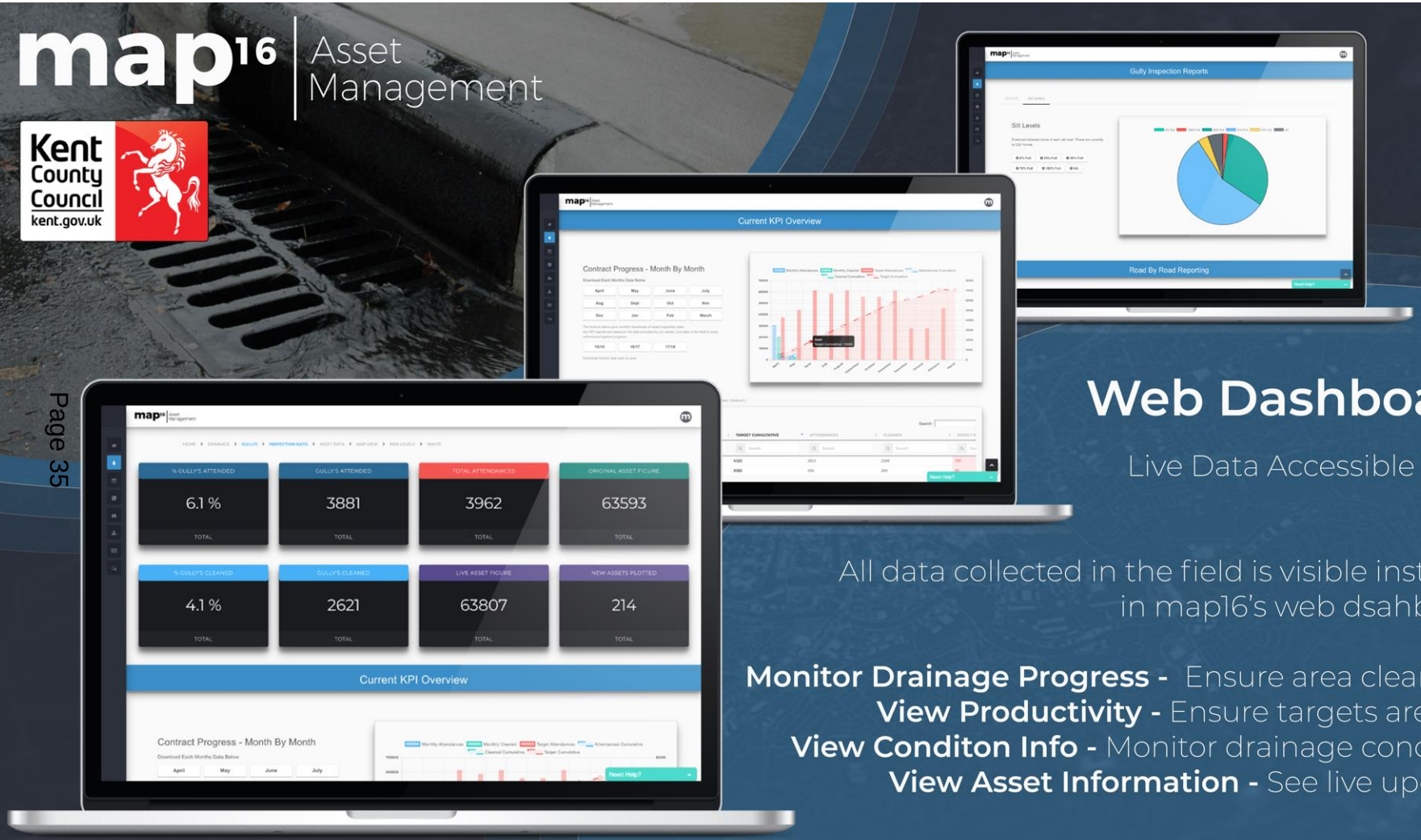

Web Dashboard

Live Data Accessible To All

All data collected in the field is visible instantly in map16's web dsahboard

Monitor Drainage Progress - Ensure area cleansing
View Productivity - Ensure targets are met
View Conditon Info - Monitor drainage condition
View Asset Information - See live updates

map16 | Asset Management

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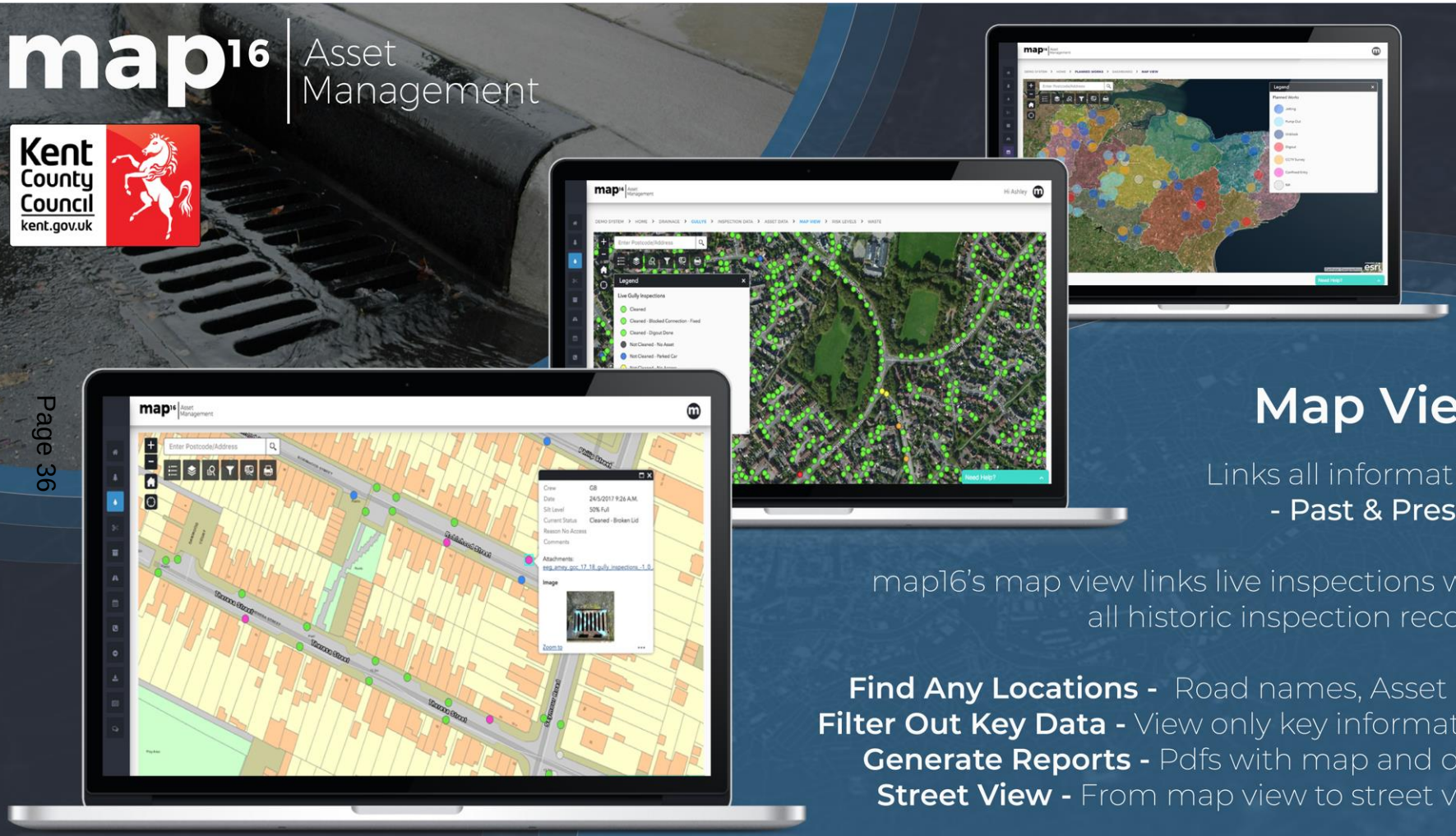

Map View

Links all information
- **Past & Present**

map16's map view links live inspections with all historic inspection records

Find Any Locations - Road names, Asset ID's
Filter Out Key Data - View only key information
Generate Reports - Pdfs with map and data
Street View - From map view to street view

map16 | Asset Management

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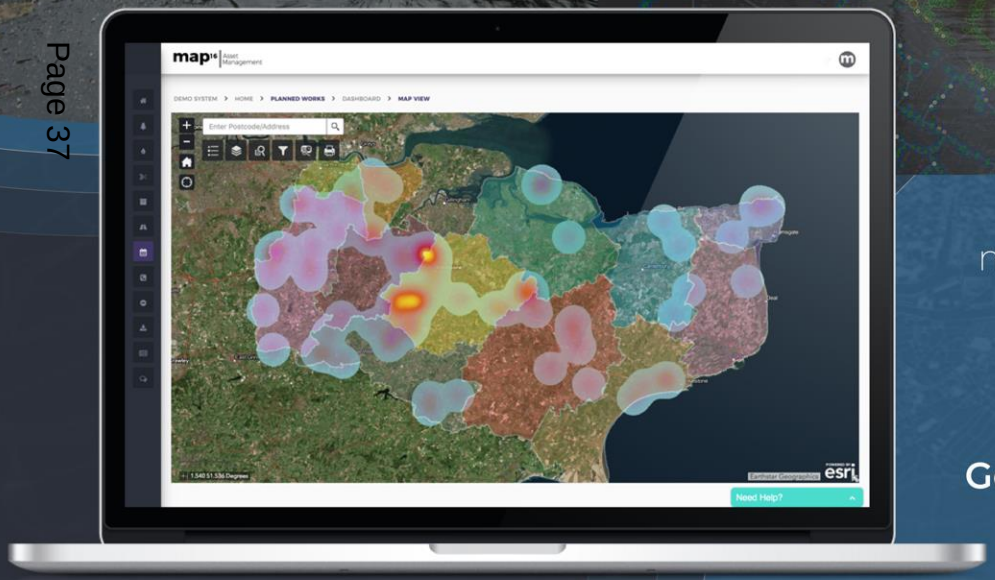


Risk Analysis

Data analysis
A Risk Based Approach

map16's allows data to be interrogated to identify clear hotspots within the drainage network

Silt Level Analysis - High silt level areas
Identify Risk Areas - Data driven outcomes
Generate Risk Reports - Pdf's with clear risk data

Any Questions

Sanjay Johal (NFF Flood Resilience Officer)

Engaging Flood Risk Communities in Kent

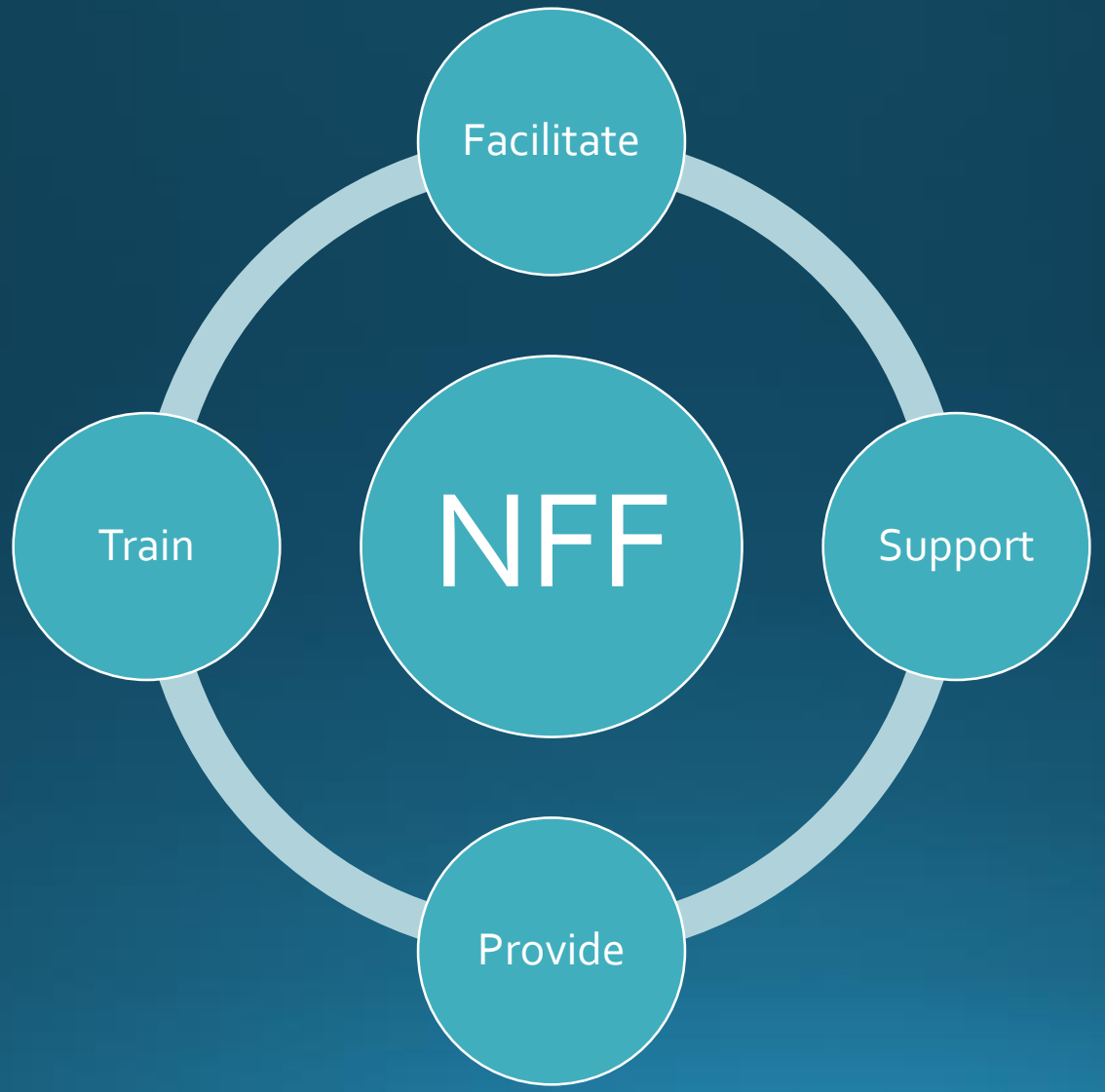
What is 'The National Flood Forum'?

- Helps people to prepare for flooding
- Helps them to recover their lives when they have been flooded
- Works to ensure that flood risk communities are at the centre of policy making and operational delivery

National Flood Forum

Supporting and Representing Flood Risk Communities

What the NFF do?



The objectives of working with Flood Risk Communities in Kent:

- Improve the understanding of local flood risk within selected communities
- Support local communities to lead on, and actively manage, local flood risk
- Improve the communication between flood vulnerable communities and the appropriate risk management authorities
- Reduce flood risk through appropriate locally led flood risk management
- Improve the resilience of flood vulnerable communities
- Identify transferable best practice for future application in other areas

Risk Management Agencies Involved

- Kent County Council
- Kent County Council Highways Department
- Environment Agency
- Southern Water
- Local councils
- Internal drainage boards
- Kent Resilience Team

Grass-roots: Why a flood action group?

- Brings the community together
- Enables them to work in collective partnership with those that manage flood risk
- Supports how they can prepare to reduce the impact on their home & community
- Working with local voluntary groups to support flood action groups in instigating and supporting community emergency flood plans.

'Supporting and Representing Flood Risk Communities'

Working with Flood Wardens

Flood Wardens work in partnership with local community,

Work with EA flood wardens who have been established in the area.

Flood Action Groups aim to work through local flood risk issues

Working with flood wardens in the area will empower them to work on issues with the community in partnership with the local authorities.

Areas I’m working in

- Hildenborough
- Ightham
- Headcorn
- Tonbridge
- Tunbridge Wells
- Five Oak Green
- East Peckham
- Iwade

Ightham

- Flood Action Group set up in 2017.
- The group have met multiple times with RMA's to discuss the flood risk in the community.
- One of the main areas of concern was riparian ownership and responsibility issues on the Busty.
- Flood Action Group held riparian owner evening event to discuss these issues and the event was a success.

Ightham

- The Flood Action Group have had a walkover of key areas of concern with KCC and identified an issue that KCC is rectifying.
- The Flood Action Group also conducted their first clean up day on the busty and surrounding areas.
- The Flood Action group are liaising with KCC who are delivering a PFR project on flood risk properties in Ightham

Headcorn

- Flood Action Group set up in 2017.
- The group have met multiple times with RMA's to discuss the flood risk in the community.
- One of the main areas of concern was surface water issues and development in the area.
- Flood Action Group have produced newsletter to inform community of their process

HEADCORN FLOOD ACTION GROUP NEWSLETTER

Issue #1

Headcorn Flood Action Group Newsletter

A COMMUNITY WORKING IN PARTNERSHIP TO ALLEVIATE HEADCORN'S FLOOD RISK

IN THIS ISSUE APRIL 2018

What is a Flood Action Group?

The group was formed in April 2017 and has steadily worked towards making some real progress with some of the issues related to flooding in and around the village. We are a core of local people from Headcorn who act as representatives to reduce flood risk in our area. We hold Multi Agency Meetings to identify key issues & are working in partnership with the agencies & authorities that manage flood risk. (Kent County Council, Southern Water, Environment Agency, Emergency services & National Flood Forum).

Members of the Flood Action Group

Meeting with the agencies

- What have the Flood Action Group been up to?
- Updates on flood works
- Trouble getting home insurance?
- Riparian Law
- Resilience plan *(how to cope with the event when it happens)*
- Why Join the Flood Action Group?

Page 50

Riparian Law

If you own land or property next to a brook, river, stream or ditch you are a 'riparian landowner'. Please use link for 'Living on the edge' booklet to check your rights & responsibilities:
https://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities

5.2 Million
1 in 6 homes in the UK are at serious risk of flooding. That's 5.2million households

parliament.uk EFRAC Report 2016-17:
"More frequent, more intense storms resulting from climate change will in future put more people at risk."

Fast Facts

Headcorn

- Flood Action Group liaised with Southern Water and had a stand at a public engagement event set up in May.
- Group also set to have community day in the future and to set up resilience meetings with KRT.

Hildenborough

Group have met with RMA's.

Issues around the Medway Flood Action Plan are to be addressed.

The group is made up of representatives of local community, flood warden and Parish Council.

Flood Action Group Liaising with EA to support them with upcoming drop-in session to discuss Leigh FSA scheme

Tunbridge Wells

Group was established in Spring 2018 year and are working in partnership approach with all RMA's

Flood Events from 2017 meant that some residents only moved back into their properties just before Easter 2018.

Group is made up of local residents and local business owners with support from MP.

Work going forward

To arrange meetings with other Flood Risk communities in Kent to start engagement.

Begin the self sufficiency process

Hold further multi-agency meetings with Flood Action Groups

Begin to get established Flood Action Groups to start thinking about their community resilience plans

Questions

To: Kent Flood Risk Management Committee – 12th November 2018

From: Katie Stewart, Director of Environment, Planning and Enforcement

Subject: Environment Agency and Met Office Alerts and Warnings and KCC severe weather response activity since the last meeting.

Classification: Unrestricted

Summary: To update Kent Flood Risk Management Committee on the water resources situation, Environment Agency and Met Office Warnings, and flood response activity since the last meeting of the Committee on 16th July 2018. Members are requested to note this report and contribute to policy evolution through oversight and debate.

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1. Background

1.1 KCC Resilience and Emergency Planning Service Duty Emergency Planning Officer (DEPO) and Contact Point receive Environment Agency and Met Office alerts and warnings on a 24/7 basis. Site specific severe weather impacts are notified to the DEPO by the emergency services and other resilience partners, with reports from the public received by Contact Point and passed to the DEPO and/or Kent Highways as appropriate. Potential impacts are then considered and an appropriate response mobilised.

1.2 Some 85,500 properties in Kent are located within areas identified as potentially at risk from fluvial (river) or tidal flooding. Where possible, these properties are offered a Flood Warning Service by the Environment Agency. However, other parts of the County are also potentially vulnerable to surface and ground water flooding. Early warning of flood risk to communities (including areas outside floodplains) is delivered through Flood Guidance Statements, Severe Weather Warnings and mobilisation of Severe Weather Advisory Group (SWAG).

2. Latest situation

2.1 The Kent and South London area received 57% of long-term average rainfall in September, with monitoring indicating that this trend has continued into October. As a consequence, all river catchments in Kent remain within below normal or normal ranges. Flow conditions are such that 75 abstractors across the Darent, Medway, Rother and Stour catchments remain subject to restrictions.

2.2 The ground is unusually dry for the time of year and as such, soil moisture deficits have remained consistently high and are above long-term average. Groundwater levels have continued to recede and are at the lower end of normal range in west Kent, although they are holding up a little better in east Kent which has experienced slightly more rainfall in recent months (for example, Thanet saw 66% of long-term average rainfall in September while the Medway catchment saw just 52%).

2.3 Reservoir levels in Kent have declined in recent months, but all remain within their normal ranges for the time of year.

2.4 As a result of the warm dry summer and autumn, only 2 flood alerts were issued by the Environment Agency for Kent (1 fluvial and 1 coastal)[1]. This contrasts with 16 flood alerts (2 fluvial and 14 coastal) during the corresponding period in 2017.

2.5 A total of 11 yellow Met Office severe weather warnings have been issued (5 for thunderstorm, 1 for wind and rain and 5 for wind)[2]. This compares with 6 warnings (1 for fog, 3 for rain, and 2 for wind) during the same period last year.

2.6 The Thames Barrier was closed on 3 occasions since the last meeting of the Committee, all for test purposes[3]. The figure for the corresponding period in 2017 was 5, all for test purposes.

2.7 A small number of localised surface water and highway flooding incidents were reported to the DEPO since the last meeting of the Committee. Notably, these included a localised but intense rainfall event on 8th August, which resulted in flooding of the basement of Invicta House in Maidstone.

3. Looking forward

3.1 The Met Office forecast for the next three months does not indicate a strong signal for either wetter or drier than average weather.

3.2 Coastal flooding is most likely in the autumn and winter, when storm systems can generate large waves and storm surges which may coincide with spring tides. The Environment Agency continuously runs surge forecasts informed by astronomical tide calculations. If a risk of coastal flooding is indicated, this information is communicated to partners in a timely fashion. Locally, spring tides are forecast to peak between 23rd – 26th November and 23rd – 26th December 2018.

3.3 Elected Members will continue to be regularly briefed on the prevailing water resources situation, flood alerts, severe weather warnings, operational response and significant flood or other severe weather events affecting Kent.

4. Recommendations

4.1 That Members:

- Note the current water resources situation and the level of warnings received since the last meeting of the Committee.

Tony Harwood, Resilience and Emergency Planning Manager, Growth Environment and Transport tel. 03000 413 386 e-mail tony.harwood@kent.gov.uk

Background documents: None

[1] Please see appendix 1
[2] Please see appendix 2
[3] Please see appendix 3

Appendix 1: Environment Agency Flood Alerts issued since 16th July 2018		
Flood Zone	**Date issued**	**Status**
Rivers Shuttle and Cray	20/07/2018	Alert

Appendix 2: Kent Severe Weather Warnings issued since 16th July 2018				
	July	**August**	**September**	**October**
Thunderstorm	4[1]	1	0	0
Wind	0	0	5[2]	0
Wind & Rain	0	0	1[3]	0

1 Relates to three separate events
2 This covered two events with the total including updates. The warning for the second event (which accounts for four warnings) was cancelled prior to the event as the low pressure it related to failed to develop as expected.
3 The warning for this event was cancelled prior to the event occurring as the winds were no expected to lead to impacts.

Appendix 3: Environment Agency Thames Barrier closures since 16th July 2018		
Thames Barrier closures	**Date**	**Status**
Thames Barrier closed	01/07/2018	Test
Thames Barrier closed	23/09/2018	Test
Thames Barrier closed	11/10/2018	Test

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